REMARKS

Applicant requests favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

To place the subject application in better form, the specification has been amended to correct minor informalities. Also, a new abstract is presented in accordance with preferred practice. No new matter has been added by these changes.

Claims 1-11 are presented for consideration. Claims 1 and 11 are independent. Claims 1 and 3 have been amended to clarify features of the subject invention, while claim 11 has been added to recite additional features of the subject invention. Support for these changes and this claim can be found in the original application, as filed. Therefore, no new matter has been added.

Applicant requests favorable reconsideration and withdrawal of the rejection set forth in the above-noted Office Action.

Claims 1-10 have been rejected under 35 U.S.C. § 103 as being unpatentable over U.S. patent application publication number 2001/0055117 to Mizutani. Applicant submits that the cited art does not teach many features of the present invention, as previously recited in independent claim 1. Therefore, this rejection is respectfully traversed. In addition, Applicant submits that independent claims 1 and 11, for example, as presented, amplify the distinctions between the present invention and the cited art.

Independent Claim 1 as currently amended is directed to exposure apparatus which draws a pattern on a substrate with electron beams. In the apparatus, a substrate stage supports the substrate and a transfer stage moves the substrate stage. An electromagnetic actuator moves the

substrate stage relative to the transfer stage. A first measuring system measures the position of the transfer stage and a second measurement system measures the position of the substrate stage. A controller controls the electromagnetic actuator on the basis of measurement results obtained by the first and second measurement systems. A deflector deflects electron beams which irradiate the substrate and a filter filters the measurement result obtained by the second measurement system and supplies the filtered measurement result to the deflector.

In Applicant's view, Mizutani discloses an alignment method which performs alignment of a substrate on which a first mark is formed with respect to an exposure position. According to the method, the positional relationship between the first mark and a second mark formed in an area different from the first mark is measured and stored. The position of the second mark after the substrate is moved to a vicinity of the exposure position in a state in which relative positions of the first mark and the second mark are maintained to be substantially constant is measured. The alignment of the substrate is performed based on the measurement result and the stored positional relationship.

According to the invention of Claim 1, exposure apparatus that draws a pattern on a substrate with electron beams has both a substrate stage to support a substrate and a transfer stage to move the substrate stage. An electromagnetic actuator which moves the substrate stage relative to the transfer stage is controlled by measurement results of a first transfer stage position measurement system and a second substrate stage position measurement system. The measurement result of the substrate stage position measurement system is filtered and the filtered measurement is supplied to a deflector that deflects the electron beams with which the substrate is irradiated.

Mizutani may disclose an alignment method for aligning a substrate on which a first mark is formed. In Mizutani, the positional relationship between the first mark on the substrate and a second mark on a substrate holding member is measured and stored. The position of the second mark on the holding member is measured after the substrate is moved to the vicinity of the exposure position and substrate alignment is performed based on the stored positional relationship between the first mark on the substrate and a second mark on a substrate holding member and the measured position of the second mark on the holding member. Mizutani, however, fails to suggest anything related to drawing a pattern on a substrate with electron beams or a deflector arranged to deflect the electron beams based on measured results of the position of a substrate stage as in Claim 1.

It is a feature of Claim 1 that a filter performs filtering for a substrate position measurement result obtained by a substrate position measurement system and supplies the filtered measurement result to the deflector which deflects the substrate irradiating electron beams. Mizutani may teach in paragraph 0018 "the positions of the first mark on the substrate and the second mark can be detected by an off-the-axis type mark-detecting system that uses, for example, wide-band illuminating light (detecting light) having a wavelength band different from that of an exposure beam". The use of wide band illuminating light of a wavelength band different from an exposure beam, however, is directed away from and is completely different from filtering a substrate position measurement result and supplying the filtered measurement result to an electron beam deflector as in Claim 1.

It is another feature of Claim 1 that a first measurement system measures the position of a transfer stage which moves a substrate stage and a second measurement system measures the

position of the substrate stage. Mizutani only teaches measuring and storing the positional relationship between the first mark on the substrate and a second mark on a substrate holding member and measuring the position of the second mark on the substrate holding member but is devoid of any suggestion of a transfer stage that moves a substrate stage or of measuring the position the transfer stage and using position measurements of the substrate stage and the transfer stage to control an electromagnetic actuator that moves the substrate stage relative to the transfer stage as in Claim 1. Accordingly, it is not seen that Mizutani's alignment method based on a first mark on a substrate and a second mark on the substrate holder in any way suggests a first measurement system that measures the position of a transfer stage for moving a substrate stage and a second measurement system that measures the position of the substrate stage and controlling an electromagnetic actuator responsive to the measurements by the first and second measurement systems as in Claim 1. In at least the foregoing respects, it is believed that Claim 1 as currently amended is completely distinguished from Mizutani and is allowable.

New independent Claim 11 is directed to exposure apparatus which draws a pattern on a substrate with electron beams. In the apparatus, a substrate stage supports the substrate and a transfer stage moves the substrate stage. An electromagnetic actuator moves the substrate stage relative to the transfer stage. A first measuring unit measures the position of the substrate relative to a reference position and a second measurement unit measures the position of the substrate stage relative to the transfer stage. A third measurement system measures the position of the transfer stage. A controller controls the electromagnetic actuator on the basis of measurement results obtained by the second measurement unit and the third measurement unit.

A deflector deflects electron beams which irradiate the substrate. The deflector is controlled on the basis of a measurement result obtained by the first measurement unit.

It is a feature of Claim 11 that a first measurement unit measures the position of a substrate in an exposure apparatus that draws a pattern on the substrate with electron beams relative to a reference position; a second measurement unit measures the position of the substrate stage relative to a transfer stage which moves the substrate stage; and a third measurement unit measures the position of the transfer stage. An electromagnetic actuator that moves the substrate stage relative to the transfer stage is controlled on the basis of measurement results obtained by the second (substrate stage position relative to the transfer stage) measurement unit and the third (transfer stage position) measurement unit.

As discussed with respect to Claim 1, Mizutani is devoid of any suggestion of electron beam pattern drawing by an exposure apparatus and only teaches measuring and storing the positional relationship between the first mark on the substrate and a second mark on a substrate holding member and measuring the position of the second mark on the substrate holding member. Accordingly, Mizutani's use of a first mark on a substrate and a second mark on a substrate holder for alignment fails in any manner to suggest the use of a transfer stage that moves the substrate stage or the use of measurement of the substrate stage position relative to the transfer stage and the measurement of the transfer stage position to control an electromagnetic actuator which moves the substrate stage relative to the transfer stage as in Claim 11.

It is a further feature of Claim 11 that a deflector deflects electron beams with which a substrate is irradiated and that the deflector is controlled on the basis of a measurement result obtained by the first (substrate position relative to the transfer stage) measurement system. As

discussed with respect to Claim 1, Mizutani is devoid of any suggestion of electron beam drawing of a pattern by an exposure apparatus or deflecting electron beams. Accordingly, it is not seen that Mizutani's alignment method that measures the positional relationship between the first mark on the substrate and a second mark on a substrate holding member and the position of the second mark on the substrate holding member could possibly suggest the feature of controlling a deflector which deflects electron beams with which a substrate is irradiated on the basis of measurement of the position of a substrate stage for holding a substrate relative to a reference position as in Claim 11. In at least the foregoing respects, it is believed that new Claim 11 is completely distinguished from Mizutani and is allowable.

Applicant submits that the cited art does not teach or suggest such features of the present invention as recited in independent claims 1 and 11.

For the foregoing reasons, Applicant submits that the present invention, as recited in independent claims 1 and 11, is patentably defined over the cited art.

Dependent claims 2-10 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims. Further individual consideration of these dependent claims is requested.

Applicant further submits that the instant application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action and an early Notice of Allowance are requested.

Applicant's attorney, Steven E. Warner, may be reached in our Washington, D.C. office by telephone at (202) 530-1010 All correspondence should continue to be directed to our address given below.

Respectfully submitted,

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